

Summary Report

Data Collection and Management Program Review

Southwest Fisheries Science Center

July 28-August 1, 2013

INTRODUCTION TO THE REVIEW

Charge to the Southwest Fishery Science Center Coastal Marine Pelagic (CPS) and Highly Migratory Species (HMS) Data Program Review Panel

Purpose of the Review: Reviews of the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) Science Centers (including associated laboratories) are conducted annually to:

- Evaluate the quality, relevance, and performance of science and research conducted in NMFS Science Centers and associated laboratories to both internal and external interests
- Help strategically position the Science Centers in planning of future science and research

Scope of the Review: This review will cover the science and research of the Southwest Fishery Science Center's (hereafter Center) Coastal Pelagic Species (CPS) and Highly Migratory Species (HMS) programs pertaining to the Magnuson-Stevens Act (MSA). The theme of this review is scientific abundance, biological and catch data as they relate to fishery stock assessments conducted pursuant to the Magnuson-Stevens Act.

Each reviewer was asked to independently prepare a written assessment and provide these to the Chair, who then created a report summarizing the individual assessments (see *SUMMARY OF INDIVIDUAL REPORTS* section).

Terms of Reference for 2013 Data Collections Science Program Reviews

Objective: The objective for this review is to review and evaluate the Center's current scientific abundance, biological and catch data as it relates to fishery stock assessments conducted pursuant to the Magnuson-Stevens Act:

- NOAA ship-based surveys
- Cooperative research surveys
- Logbook and observer data
- Data management and quality control

Overarching Questions for Reviewers:

- Relationship of current and planned fishery assessment data activities to Center fishery assessments mandates and requirements – is the Center doing the right things?

- Opportunities – are there opportunities that the Center should be pursuing in collecting and compiling fishery assessment data, including shared approaches with partners?
- Scientific/technical approach – are the Center’s fishery data objectives adequate, and is the Center using the best suite of techniques and approaches to meet those objectives?
- Organization and priorities – is the Center’s fishery data system properly organized to meet its mandates and is the allocation of resources among program appropriate?
- Scientific conduct – are the Center’s fishery data programs being conducted properly (survey design, integrity, peer review, transparency, confidentiality, PII, etc.)?

Using the two-three typical and important assessments presented by the Center, reviewers should address:

1. To what extent do fishery-independent survey data quality, statistical precision, and timeliness issues impact overall assessment adequacy and timeliness?
2. What are the major fishery independent survey successes and how should they be supported?
3. What are the major fishery-independent survey limitations/weaknesses and how could they be resolved?
4. To what extent do fishery-dependent data quality, statistical precision, and timeliness issues impact overall assessment adequacy and timeliness?
5. What are the major fishery-dependent data sources successes and how should they be supported?
6. What are the major fishery-dependent data limitations/weaknesses and how could they be resolved?
7. What recommendations do you have for prioritizing fishery-independent versus fishery-dependent data collection improvements?
8. To what extent are fishery-independent and fishery-dependent data readily accessible to Center stock assessment scientists and to various external researchers who may wish to replicate NMFS stock assessments?
9. Identify the highest priority needs for improving fishery dependent and fishery independent data.

Benchmark Standards:

The review panel established benchmark standards to assess program goals and objectives. The definitions for these benchmarks are defined below.

(3) *Exceeds expectations*: Science program consistently does more than expected for the major areas of responsibility for data collection to support stock assessment activities outlined by the MSA, and conclusion is supported by several objective examples going beyond requirements and standards.

(2) *Meets expectations*: Science program consistently meets expectations for the specific mandates outlined by the MSA. The program consistently and fully satisfied the high performance expectations of a NOAA Fishery Science Center for the major areas of responsibility for data collection regarding impact, timeliness, cost effectiveness, client

satisfaction, accuracy, consistency, etc. to support stock assessment activities outlined by the MSA.

(1) Needs improvement: Science program did not consistently meet performance expectations.

BACKGROUND INFORMATION

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) includes directives to 1) prevent overfishing, 2) rebuild depressed fish stocks to levels of abundance that produce maximum sustainable yield, 3) develop standardized reporting methodologies to assess the amount and type of bycatch, 4) adopt measures that minimize bycatch and bycatch mortality, to the extent practicable, 5) describe and identify essential fish habitat, and 6) assess the impact of human activities, including fishing impacts, on habitat. The MSA also encourages the participation of the fishing industry in fishery research. These directives require substantial data collection and research efforts to support management of West Coast fisheries.

Population assessment is a mandated activity for NMFS. The Center provides scientific data, analysis and technical advice regarding population assessment to NMFS Headquarters, Pacific Fishery Management Council (Council), West Coast Regional Office, State of California, Scientific Review Groups, and the U.S. delegations to international regional fishery management organizations and international treaties.

The review panel was tasked to evaluate data collection activities for two fishery management plans (FMPs): Coastal Pelagic Species and Highly Migratory Species.

Coastal Pelagic Species Fishery Management Plan

The Council's CPS FMP specifies a management framework for northern anchovy, market squid, Pacific sardine, Pacific mackerel, and jack mackerel. In 2006, the CPS FMP was amended to include all krill species and to prohibit their harvest. This proactive Council recommendation was intended to protect krill's vital role in the marine ecosystem.

Coastal pelagic species can generally be found anywhere from the surface to 1,000 meters deep, and spatial distributions span international boundaries. Pacific sardine and Pacific mackerel are actively managed, while the three other species are either managed at the state-level (market squid) or are landed in low numbers and are therefore monitored for potential elevation to active management in the future. Krill are not assessed or monitored.

Highly Migratory Species Fishery Management Plan

The term "highly migratory species" derives from Article 64 of the United Nations Convention on the Law of the Sea. Although the Convention does not provide an operational definition of the term, an annex to it lists species considered highly migratory by parties to the Convention. In general, these species have a wide geographic distribution, both inside and outside countries'

200-mile zones, and undertake migrations of significant but variable distances across oceans for feeding or reproduction. They are harvested by U.S. commercial and recreational fishers and by foreign fishing fleets. Only a small fraction of the total harvest is taken within U.S. waters.

The HMS FMP authorizes the Council to manage the following species: north Pacific albacore, yellowfin tuna, bigeye tuna, skipjack, northern bluefin tuna, common thresher shark, pelagic thresher shark, bigeye thresher shark, shortfin mako shark, blue shark, striped marlin, Pacific swordfish, and dorado.

Under the FMP, the Council monitors other species for informational purposes, and some species, such as great white shark, megamouth shark, and basking shark, are designated as prohibited.

SUMMARY OF INDIVIDUAL REPORTS

The Southwest Fisheries Science Center is located in La Jolla, California, just north of the Scripps Institution of Oceanography, University of California, San Diego campus. Over a period of three days, the panel received 31 presentations (Appendix 1) covering all aspects of the scientific programs under review, as well as an enormous amount of reference material. The fourth day was reserved for discussions between the review panel and Center management and staff. Part of the fourth day included an opportunity for Center staff to meet with the panel without management being present.

The panel decided to focus their review on the five overarching questions provided in the terms of reference for the CPS and HMS programs, assigning one of the three benchmark standards to each question for each program, and supplementing these scores with explanations in their individual reports. Reviewers also offered general comments relating to the overall science program or to other topics they felt were noteworthy.

Some general themes emerged. First, based on panel internal discussions and individual reviews, there was consensus on the high degree of professionalism, expertise, and dedication of all Center personnel despite facing challenging workload assignments and budget limitations. The panel also expressed appreciation for the considerable amount of time and effort the presenters put into describing their research program in a clear and organized way. Center management and staff openly and astutely discussed the strengths and limitations of the programs under review, which greatly enhanced the ability of the panel to do their job.

The Center must operate under fiscal and logistical constraints; an ideal program that satisfies data collection requirements for all information needs would quickly outstrip available staff time and program funding. Because of this, the panel felt that additional strategic guidance would be beneficial in prioritizing goals and objectives for both CPS and HMS programs.

In general, the Center met or exceeded expectations for their research program (Table 1), with the exception of question 4, which focused on organization and priorities. It was here where staff vacancies in data management inhibited success in both programs. The panel considered challenges related to data management as the highest priority for the Center.

For the CPS program, many reviewers suggested examining whether the frequency of assessments was optimal. Most also suggested that the Center enhance collaborative efforts for data collection with Mexico and the State of California. Some reviews noted that the program would be enhanced by greater collaboration and outreach with the fishing community to collect data that would be used in assessments.

For the HMS program, the panel emphasized that clarification of the program's scientific responsibilities would be beneficial given the nature of migratory species and the need for staff to work intensively with many other countries and management organizations. Reviewers offered different suggestion to consider in defining the scope of the HMS program. One option might be to expand the program by adding staff and performing assessments for additional species while another option might be to focus on tractable research related to life history parameters (e.g. growth rates). Clearly, many opportunities exist for enhancing data collection activities, but these must be weighed against limited budget and staff resources. Many reviewers also emphasized that continued cooperation with the Pacific Islands Fishery Science Center and Mexico would be advantageous.

Table 1. Summary of Benchmarks Standards for Overarching Questions

Overarching Questions		Reviewer 1 CPS HMS		Reviewer 2 CPS HMS		Reviewer 3 CPS HMS		Reviewer 4 CPS HMS		Reviewer 5 CPS HMS		Mean CPS HMS	
1	Relationship of current and planned fishery assessment data activities to Center fishery assessments mandates and requirements - is the Center doing the right things?	2	3	3	2	2	2	2	2	3	3	2.4	2.4
2	Opportunities - are there opportunities that the Center should be pursuing in collecting and compiling fishery assessment data, including shared approaches with partners?	3	3	2	2	2	2	2	2	3	3	2.4	2.4
3	Scientific/technical approach - are the Center's fishery data objectives adequate, and is the Center using the best suite of techniques and approaches to meet those objectives?	3	3	3	3	2	2	3	2	3	2	2.8	2.4
4	Organization and priorities - is the Center's fishery data system properly organized to meet its mandates and is the allocation of resources among programs appropriate?	2	1	1	1	1	1	1	1	2	2	1.4	1.2
5	Scientific conduct - are the Center's fishery data programs being conducted properly (survey design, integrity, peer review, transparency, confidentiality, PII, etc.?)	2	2	2	2	3	3	2	2	3	2	2.4	2.2
Overall mean score												2.3	2.1

INDIVIDUAL REPORTS

Individual reports from each of the 5 reviewers are presented in sequence to match the scores in Table 1.

Reviewer 1

Comments related to SWFSC external review objectives (July 29-August 1, 2013)

Reviews of the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) Science Centers (including associated laboratories) are conducted annually to:

- evaluate the quality, relevance, and performance of science and research conducted in NMFS Science Centers and associated laboratories to both internal and external interests*
- help strategically position the Science Centers in planning of future science and research.*

Overall comment on the nature of the review: The review provided a good vehicle for evaluating the science and research conducted at the SWFSC in relationship to two important species groups, Coastal Pelagic Species (CPS) and Highly Migratory Species (HMS). The presentations were uniformly professional. A broad range of information was provided and there was good interchange between the review panel and SWFSC staff.

The fishery management context of science and research on both CPS and HMS was well addressed by SWFSC staff, and it was useful to have a presentation and participation from the NOAA Fisheries Southwest Regional Office (SWRO). The SWFSC's new strategic science plan was briefly outlined but there was little reference to that strategic science plan and its priorities in subsequent presentations. It would seem useful to have further discussion with the SWFSC staff on the priorities in that plan.

Overarching Questions for Reviewers

Five over-arching questions were posed to the review panel which decided to score them on a three point scale for each of the two species groups addressed: 3 = Exceeds Expectations; 2 = Meets Expectations; and 1 = Needs Improvement. It is important that for this reviewer, the norm would be 2, Meets Expectations with only a few, exceptional scores of 3, Exceeds Expectations. As for 1, Needs Improvement responses, these are intended to identify points that need attention, and in several cases just a few points within the range of activities that might inhabit a question, so that score should not necessarily indicate sub-par performance by the Center on every aspect of that question.

➤ *Relationship of current and planned fishery assessment data activities to Center fishery assessments mandates and requirements – is the Center doing the right things?*

CPS 2 [Meets Expectations] HMS 3 [Exceeds expectations]

The relationship of overall CPS and HMS science and research responsibilities relative to mandates and requirements was clear. There were, however, some questions about the relative weight of fishery management and stakeholder interests in the prioritization of assessments (and thus to the frequency of surveys and related workload) that suggest that a stronger relationship with the strategic outlook of the Center would be appropriate, including socialization of the SWFSC strategic plan to fishery managers and stakeholders.

It is notable that the SWFSC sits down with the SWRO and the Pacific Fishery Management Council (Council) following each Council meeting to do a “post mortem” on follow-up needs requiring Center involvement, including data products. These types of data requests and ad hoc analyses could be distracting to the underlying business of building time-series and conducting scientific research, even though their utility to fishery managers is important. By having a formal structure for discussing such requests (the post-mortem), it would appear this is not a major problem for the Center.

On a technical level, it was not as clear the extent to which the current frequency and depth of CPS monitoring (surveys) and stock assessments were optimal. It was helpful to see that the key assessment staff at the Center had proposed an adaptive assessment approach to the Pacific fishery management council, and they are encouraged to continue to encourage that approach. At the same time, and perhaps because they continue to follow the current Council lead, it was not as obvious whether the current relationship between surveys and assessment was efficient.

For HMS monitoring and stock assessment, NOAA Fisheries appears to face a question of the relationship of international responsibilities that are inherent in the nature of HMS species, in the sense that biologically the species cross boundaries, operationally U.S. commercial fisheries and fisheries from other nations intermingle on the high seas outside of Exclusive Economic Zones (EEZs), and much of the management of HMS fisheries is through international bodies (Regional Fishery Management Organizations, RFMOs) rather than through U.S. domestic decision-making. This reviewer believes that it is in the U.S. strategic interest to participate fully in the international scientific investigation and management of these species, but the mandates for such efforts, particularly on the science side, were not clear.

➤ *Opportunities – are there opportunities that the Center should be pursuing in collecting and compiling fishery assessment data, including shared approaches with partners?*

CPS 3 [Exceeds] HMS 3 [Exceeds]

While there are some important steps that the CPS and HMS programs could take to enhance their work with partners, both programs are already heavily invested in partnerships.

The CPS program is deeply integrated in the CalCOFI program, and hence with the State of California and UCSD Scripps Institute. It was clear that greater outreach to the fishing industry, including increased collaborative cooperative research would be useful if for no other reason than increasing confidence in the fishing industry, and thus in management agencies, in the quality of the science being undertaken by the CPS program. The CPS program could also benefit from alliances with NOAA's Office of Oceanic and Atmospheric Research in terms of monitoring and utilization of environmental variables. Nonetheless, the existing collaborations, including in addition the role of the Center's Environmental Research Division (ERD), not reviewed here, represent a high point for the scientific efforts of NOAA Fisheries.

The HMS program is also deeply involved with the ISC (International Scientific Committee on Tuna and Tuna-like Species), and through its ISC collaborations, with the NOAA Fisheries Pacific Islands Fishery Science Center and the member countries of the ISC (Canada, China, Japan, Mexico, South Korea, and Taiwan). It also collaborates on a range of levels with its co-located partner, the Inter-American Tropical Commission.

➤ *Scientific/technical approach – are the Center's fishery data objectives adequate, and is the Center using the best suite of techniques and approaches to meet those objectives?*

CPS 3 [Exceeds] HMS 3 [Exceeds]

Each program has robust fishery information collection programs that are directly linked to their stock assessments.

It is possible that the CPS surveys might be more efficient in terms of its relationship to CPS stock assessments, but this would need to be balanced with the role of CPS surveys in the broader ecosystem understanding of CPS fish stocks.

HMS stock assessments primarily rely on fishery-dependent data. As a result, the SWFSC approach to those stock assessments is largely captive to external data sources. Nonetheless, the relationship of these data sources to the HMS stock assessments was clear and it was obvious that considerable effort goes into international working groups to scrutinize such data sources. In addition, there was a good relationship of the HMS program's own fishery-independent research to its stock assessment needs.

➤ *Organization and priorities – is the Center’s fishery data system properly organized to meet its mandates and is the allocation of resources among program appropriate?*

CPS 2 [Meets] HMS 1 [Needs Improvement]

Each program (CPS and HMS) recognized that more work needed to be done on their fishery information systems.

The CPS program has been taking steps to better document and manage its data, and in providing easy research access to its complex data streams. Utilization of the Center’s Environmental Research Division’s on-line data servers is a good approach.

Most of the HMS program’s information needs for North Pacific stock assessments come from international data streams, often managed in international data workshops. At the same time, it was not obvious there was a good data management scheme for handling these fishery-dependent data sources.

The HMS program has an orphaned fishery-dependent data system for U.S. tuna purse seine landings and sampling data that needs to be resolved. These data do not appear to be utilized by SWFSC for stock assessments. In an era of limited if not shrinking fiscal resources, an alternative future for management of these data should be considered.

The HMS program’s fishery-independent data system appears robust.

Overall, the Center could use an overall scientific information management plan, as could the Fisheries Resources Division, that would spell out responsibilities and implementation priorities.

➤ *Scientific conduct – are the Center’s fishery data programs being conducted properly (survey design, integrity, peer review, transparency, confidentiality, PII, etc.)?*

CPS 2 [Meets] HMS 2 [Meets]

This question was not explicitly addressed in the review, but there was sufficient discussion related to aspects of this question that this reviewer is confident that the Center has adequate approaches toward the conduct of its surveys and stock assessments.

Both the CPS and HMS stock assessments involve layers of external review (e.g., by the Council’s scientific and statistical committee (SSC), the ISC working groups, and the NMFS-funded Center of Independent Experts (CIE)) that help insure that fishery data are conducted properly.

The Center also has a formal publication review process that proceeds from oversight at the program leadership level to the Center director.

Issues with fishery data management suggest that increased attention toward protocols for the collection and management (including documentation and on-line metadata) of primary data sources should be priorities, but there is no concern that this marks a lack of integrity. In fact, staff in both the CPS and HMS programs identified data management as a concern.

Southwest Fishery Science Center

Review of data collection activities to support population assessments for Coastal Pelagic Species (CPS) and Highly Migratory Species (HMS) fishery management plans

General comments

- The Center's management and staff produced an organized, well-run and thorough review. This panelist has the highest praise for the proficiency and integrity demonstrated by all Center personnel.
- The volume of information presented was difficult to absorb during the short time frame.

OVERARCHING QUESTIONS

- (1) Data collection – Relationship of current and planned fishery assessment data activities to Center fishery assessments mandates and requirements – is the Center doing the right things?**

Coastal Pelagic Species – 3, exceeds expectations

Highly Migratory Species – 2, meets expectations

Coastal Pelagic Species

- It was evident that a good relationship exists between current and planned fishery assessment data activities and assessment mandates.
- Currently jack mackerel and northern anchovy are monitored but not actively managed. Pacific sardine are actively managed and support a significant fishery, although that might change given recent oceanographic trends. Suggest that the program develop an adaptive plan to determine what data collection activities might be developed, enhanced or downsized to accompany shifts between managed and monitored status.
- An exceptional amount of fishery independent data is collected via the CalCOFI surveys, but not much of it is used. The CalCOFI surveys also provide a great deal of data regarding climatic/oceanographic conditions. Suggest that the program further investigate linking these oceanographic data to population dynamics of managed species and determine how they may be incorporated into assessments. This effort may include developing new model frameworks or modifying old ones.
- If an enhanced partnership with Mexico cannot be achieved (see recommendation made in question 2) efforts should be made to further life history studies, otolith elemental analysis and links to water masses, and genetic stock structure in managed fish species. These suggestions build upon the technical and research strengths the Center already has in-house.

- For market squid, further life history studies on this poorly known species would enhance management efforts.

Highly Migratory Species

- Further strategic planning to clarify the scope of program responsibilities should be a top priority.
- Since fishery dependent data drive the assessments, the timeliness by which other countries submit needed data puts the relevance of assessments at risk. Suggest investigating avenues (e.g. electronic reporting) to standardize data submission to increase timeliness.
- Focus limited resources on building partnerships with countries with the highest landings to improve dataset for stock assessments for vulnerable species (e.g. Japan and Mexico for Pacific bluefin tuna).
- If enhanced partnerships with other countries for data collection cannot be achieved, efforts should be made to further life history studies, otolith elemental analysis and links to water masses, and genetic stock structure in managed fish species. These suggestions build upon the technical and research strengths the Center already has in-house.
- The program is doing a good job in meeting Endangered Species Act mandates by providing support to assess the population status of great white sharks, and perhaps other vulnerable species in the future (e.g. basking shark).

(2) Opportunities – are there opportunities that the Center should be pursuing in collecting and compiling fishery assessment data, including shared approaches with partners?

Coastal Pelagic Species – 2, meets expectations

Highly Migratory Species – 2, meets expectations

Coastal Pelagic Species

- Overall, the Center has already established many effective partnerships in this program.
- For Pacific sardine and possibly other CPS, an enhanced partnership with Mexico is encouraged.
- The successful partnership with the State of California could be expanded for market squid.
- Since the MSA encourages the participation of the fishing industry in fishery research, additional effort should be directed to engage the commercial fishing fleet to successfully collect data that can be incorporated into assessment models. Collaborative Fisheries Research West (<http://www.cfr-west.org>), a non-profit organization dedicated to developing research partnerships between fishermen, managers and scientist, could be useful as a liaison interested parties.

Highly Migratory Species

- Focus limited resources on building partnerships with countries with the highest landings to improve dataset for stock assessments for vulnerable species (e.g. Japan and Mexico for Pacific bluefin tuna).
- The program should continue to partner with the Pacific Islands Fishery Science Center.
- Given the charismatic aspect of many HMS species, the program could enhance partnerships in data collecting with the recreational fishing industry and various non-governmental entities. Collaborative Fisheries Research West (<http://www.cfr-west.org>), a non-profit organization dedicated to developing research partnerships between fishermen, managers and scientist, could be useful as a liaison interested parties.

(3) Scientific/technical approach – are the Center’s fishery data objectives adequate, and is the Center using the best suite of techniques and approaches to meet those objectives?

Coastal Pelagic Species – 3, exceeds expectations

Highly Migratory Species – 3, exceeds expectations

Coastal Pelagic Species

- The Center is using a diverse set of innovative techniques and approaches to assess Pacific sardine.
- Further effort could be directed to develop approaches to assess population trends of data-poor stocks, but this may not be a high priority.
- The Center has in-house strengths in developing innovating optical and acoustic techniques to address management information needs. The new Ocean Technology Development Test Tank will undoubtedly enhance this capability.

Highly Migratory Species

- The northern albacore assessment uses the best available suite of techniques and approaches.
- The program employs an excellent approach to use other forms of sampling (age and growth, tagging data, foraging ecology, maturity and reproductive state) to enhance management objectives in light of absent comprehensive catch and abundance data.
- The Center has in-house strengths in developing innovating optical and acoustic techniques to address management information needs. The new Ocean Technology Development Test Tank will undoubtedly enhance this capability.

(4) Organization and priorities – is the Center’s fishery data system properly organized to meet its mandates and is the allocation of resources among program appropriate?

Coastal Pelagic Species – 1, exceeds expectations

Highly Migratory Species – 1, exceeds expectations

- Both programs experience similar challenges to data management due to vacant staff positions. The Center needs to fill these positions with staff dedicated to data management rather than have personnel split time between data management and research responsibilities.
- The Center's Strategic Science Plan states (p. 8) that it provides access to nearly 700 data sets. The CalCOFI datasets alone are a national treasure. The Center would benefit from increased attention to maintaining the viability, accessibility and transparency of these databases to other researchers and the public.
- Some databases are maintained on outdated systems and need to be restructured.
- Establishing appropriate metadata for all datasets is no small effort, and should be incorporated into the upcoming Implementation Plan the Center will produce in 2014. This task could be urgent if key personnel are likely to retire soon.
- The ratio of contractors to full time employees is too high.
- The HMS program appears to be understaffed. Additional strategic planning on program priorities is necessary to determine if it is appropriate to dedicate more resources towards HMS, or to scale back or redefine the program's scope of work.

(5) Scientific conduct – are the Center's fishery data programs being conducted properly (survey design, standardization, integrity, peer review, transparency, confidentiality, PII, etc.)?

Coastal Pelagic Species – 3, exceeds expectations

Highly Migratory Species – 3, exceeds expectations

- The programs' scientific foundations are more than adequately reviewed by the Center of Independent Experts, the Pacific Fishery Management Council's Stock Assessment Review Panel and the Science and Statistical Committee.
- The staff has an excellent publication record of technical reports and peer-reviewed papers.
- There are some transparency problems regarding accessibility of data, but these stem from the data management challenges due to staff vacancies mentioned earlier and have no relationship to conduct issues.
- No data were presented regarding confidentiality or PII. It is unclear whether these issues were relevant to either program.

Reviewer 3

SWFSC CPS-HMS Data Program Review

29 July – 1 Aug 2013

This review covers the science and research of the Southwest Fishery Science Center's Coastal Pelagic Species (CPS) and Highly Migratory Species (HPS) programs pertaining to the Magnuson-Stevens Act. The theme of this review is scientific abundance, biological and catch data as they relate to fishery stock assessments conducted pursuant to the Magnuson-Stevens Act (MSA). The review is organized around five overarching questions given to the review panel:

1. Relationship of current and planned fishery assessment data activities to Center fishery assessments mandates and requirements – is the Center doing the right things?

CPS score: meets expectations (2); HMS score: meets expectations (2)

The SWFSC staff should be commended for doing a tremendous amount of work with limited resources. They generate data critical for the assessments required under the MSA and generate information for a number of other legislative and agency mandates (including Endangered Species Act work). The Center prioritizes its limited resources to accomplish its mission as thoroughly as possible and overall is doing “the right things” for both the CPS and HMS programs. However, given the increasing pressure for more fisheries information and decreasing resources it is becoming more important to do additional strategic planning to clearly establish and refine program priorities for the future. The Center needs to consider the “big picture” of the full suite of requirements under the MSA, the needs of the assessment models, and the most efficient use of resources to accomplish the greatest overall good rather than primarily reacting to current political and administrative pressures or historical precedence.

Although the CPS program collects a variety of data, it is currently prioritizing the collection of sardine assessment information. This is appropriate given the volume and economic importance of the sardine fishery, but more attention needs to be paid to the other CPS species. Some work has also been done on the actively managed Pacific Mackerel, but it is unclear whether there is enough information and a high enough need to continue the annual assessments. There is talk of dropping from annual assessments to only doing assessments every 4 years. Issues with the complicated life histories and availability of resources have hampered collection of sufficient data for proper regular assessments of the other CPS species. The Center should continue to explore opportunities to broaden its portfolio to better address more of the coastal pelagic species identified in the MSA so it can develop a plan for providing the necessary data to conduct a suite of CSP assessments on the appropriate schedule. A formal evaluation of overall CPS constraints and priorities is needed to make logical decisions on how to move forward.

The HMS are harder to assess given their migratory nature and the need to work with so many countries and international organizations to compile and evaluate the necessary data. The HMS program has primarily relied on compiling landing data for their assessments, focusing primarily on the Albacore and Blue Shark. This has not been heavily scrutinized since the HMS fisheries were generally thought to be in good shape. However, recent estimates have suggested that Bluefin Tuna stocks may be as low as 3% of their un-fished levels. If these stocks are becoming threatened, it will become more important to evaluate the options for collecting more comprehensive data and improve the assessments. The HMS program data collection program should consider what opportunities are available now to improve their data collections, in particular working with the regional fisheries management organizations to standardize and improve fishery-dependent information reporting from relevant countries as well as options to gather and incorporate fisheries independent data in the assessments.

2. Opportunities – are there opportunities that the Center should be pursuing in collecting and compiling fishery assessment data, including shared approaches with partners?

CPS score: meets expectations (2); HMS score: meets expectations (2)

As budgets tighten, taking advantage of collaborative and complementary opportunities becomes increasingly important. The SWFSC works with many national and international partners to develop combined data sets for the CPS and HMS stock assessments.

It was clear during the review that interactions with Mexico were a significant impediment to the compilation of necessary fishery-dependent data and the CPS program's ability to collect needed fishery-independent data in Mexican territorial waters. It is important that SWFSC continue to work within NOAA and other U.S. government agencies as well as relevant international groups as much as possible to try and improve relations and develop better fisheries collaborations with Mexico.

SWFSC needs to look into opportunities to work with other NOAA and academic colleagues to link in the fisheries surveys with the wide range of oceanographic and climate work being done in the same areas at the same time. There is a very rich and growing data base of climate data that could help inform the CPS and HMS programs of important drivers of stock changes of these species. Collaborating with west coast government and academic researchers could provide valuable data at little or no cost to the Center. The Center should also look into working with west coast Cooperative Institutes as a way of improving collaborations with academia and potentially helping with Center staffing problems.

Another important collaboration that needs to be strengthened and re-established is the relationship with the California Department of Fish and Wildlife (CDFW), particularly for the CPS data. For example, SWFSC should coordinate their needs to assess market squid under the CPS with the monitoring efforts already being conducted by the state. The CPS program is also particularly well poised to work with other NOAA labs and Universities along the west coast to

improve their data collection efforts. The SAKE survey is a big step in the right direction by working with NWFSC, but more can be done.

The HMS stocks are extremely difficult to quantify because these species by definition travel long distances requiring input from a number of countries. There are a number of regional management fishery organizations involved with HMS that frequently have overlapping, and sometimes competing interests. Since the U.S. is involved in many of these organizations in the Pacific, there may be an opportunity to take a leadership role in trying to coordinate their activities to promote better record keeping and reporting from all of the countries. If handled correctly, useful agreements on data management and reporting may be possible without getting too involved in the larger political complications. For example, getting these organizations to develop a well vetted set of standard practices for reporting HMS data would greatly benefit the HMS program.

3. Scientific/technical approach – are the Center’s fishery data objectives adequate, and is the Center using the best suite of techniques and approaches to meet those objectives?

CPS score: meets expectations (2); HMS score: meets expectations (2)

The Center is known for its innovative advancements in science and technologies for improved fisheries. The advancements pursued as part of the SWFSC culture are critical for meeting the increasing demands for more information on MSA species and should be encouraged. As mentioned under question 1, the SWFSC should make a priority of broadening the data collection efforts to include more species for both CPS and HMS. The difficulty is in determining how to do this under a level or decreasing budget. One approach is to look for opportunities to multi-task objectives on cruises and to explore improved and innovative new techniques that increase capabilities.

For example, the acoustics and ichthyoplankton efforts being developed at SWFSC appear to have great potential to provide information on multiple coastal pelagic species, so cruises should be designed to optimize the benefit to as many species as possible. Research into understanding population dynamics and distributions is critical for evaluating possible synergies and efficiencies on the survey cruises.

The CalCOFI program is a great example of an extremely valuable long time-series with a wide variety of complimentary measurements, including a variety of ocean physical and biogeochemical measurements. Although there are limitations to how much can be done on a single cruise, the information gained from the diverse data sets collected on CalCOFI is a great example of how environmental data can help improve understanding of CPS. Linking in environmental data into other data sets can benefit the overall program and should be pursued where possible.

The HMS can also potentially benefit from innovative advancements and linking into environmental data. A broader application of the acoustics and ichthyoplankton studies can help

improve understanding of prey species distributions for HMS. Since the Center has major efforts in both CPS and HMS, there should be more effort to collect and analyze complementary information that can help both programs where possible. An aside that may not be directly relevant to this review is the important research being conducted on improved fishing techniques (e.g. deep long line for swordfish that has less bycatch) that is very relevant to the long-term sustainability of the HMS fishing industry and should be continued by the Center.

4. Organization and priorities – is the Center’s fishery data system properly organized to meet its mandates and is the allocation of resources among program appropriate?

CPS score: needs improvement (1); HMS score: needs improvement (1)

The SWFSC has put a lot of effort into collecting a variety of observations and exploring innovative approaches for improving data collection approaches, but there has been little emphasis placed on data management and making the data easily available to the community. The CalCOFI program has been working to develop a user friendly data management system, but other components of the CPS and HMS programs need to significantly improve their data management and data serving capabilities and move away from having data stored on individual PI computers in different formats.

Both programs also noted a significant problem with being understaffed. SWFSC currently has 12 vacancies in the CPS and HMS programs. Several of these vacancies are for data management positions. Insufficient staff makes it difficult to complete required tasks on time and brings down the morale of the entire Center. Every effort should be made to find funds to bring the staffing back up to necessary levels.

The CPS program has a need for a comprehensive and adaptive CPS relational database framework to organize and manage its varied and complicated data sources. This database should help facilitate QA/QC procedures and improve data availability to partners and constituents. Ideally this would be developed in coordination with other data management efforts in the Center to build on shared expertise, take advantage of potential synergies, and make better use of resources. We are told that a couple of the vacancies in the CPS program have been approved by workforce management. Hopefully these positions can be filled quickly to improve the staff shortage.

The HMS program has at least 5 unfilled positions including 4 data managers that appear to be significantly impacting their ability to complete their mission. The HMS program would also benefit from having a statistician on staff and a clear set of priorities for how to best allocate their resources.

5. Scientific conduct – are the Center’s fishery data programs being conducted properly (survey design, integrity, peer review, transparency, confidentiality, PII, etc.)?

CPS score: exceeds expectations (3); HMS score: exceeds expectations (3)

The professional conduct of the SWFSC program staff as far as we can tell is exemplary. The programs are reviewed by the Center for Independent Experts (CIE) and Star Panels review specific processes and data streams. There are no obvious problems with the CPS and HMS programs in terms of scientific conduct (although no information was provided regarding confidentiality, PII or other similar issues). All of the staff appears to be motivated and committed to meeting the program goals and the NOAA mission, although frustration with the lack of staff was apparent. My primary concern is with the security and availability of the data. Both programs need to invest in data management to improve their transparency and data integrity. I also recommendation both programs work on improving their uncertainty estimates for the assessments so they can properly defend the decisions that are being made with the data they produce.

Reviewer 4

SWFSC Data Meeting Review

These comments focus on coastal pelagic species (CPS) with less attention to highly migratory species (HMS). My comments do not consider the relative priority of fish stock assessment and other SWFSC programs.

I use a score of 1 (below expectations), 2 (meets expectations) and 3 (exceed expectations) to summarize performance under each major question and score CPS and HMS separately. I score relative to reasonable expectations rather than relative to perfect solutions.

- 1) Is the Center doing the right things? (CPS 2; HMS 2)
 - a. Current fishery dependent and independent data collection activities appear sound, appropriate and necessary for sardine (which supports a significant fishery) although other CPS species (that are not currently assessed) involve less data collection. That said, there are sufficient data for CPS other than sardine to carryout simple, rudimentary stock assessments.
 - b. HMS is making continuously heroic efforts with limited staff to carry out fishery independent surveys. However, surveys are difficult and of reduced value in monitoring stocks because the surveys are small spatially relative to US waters and the distribution of the stocks. Fishery dependent data for HMS are also very difficult to obtain and of relatively minor value because US fisheries are small and cover relatively small areas.
 - c. With the exception of albacore, HMS data are of relatively little use for stock assessment purposes. I agree that US longline surveys are probably useful for monitoring condition of young fish in US waters.
 - d. HMS in general seems understaffed and underfunded relative to the difficulty and magnitude of the technical problems they face. A careful examination of priorities may be in order to balance expectations with capabilities. It may be important to remember that most HMS are already monitored and studied by scientists in other countries that have larger fisheries and data collected over wider areas.
 - e. HMS is doing a very good job of aggressively studying and collecting important biological data on movement patterns, growth, etc. that are important in stock assessment. This is probably a very natural and tractable focus for work by US scientists.
 - f. HMS has done a very good job in developing at least one stock assessment for data-poor sharks in response to an ESA listing. It might be useful to focus stock assessment efforts on a few such species that are important to non-fishery interests in the US, while deemphasizing work on fishery problems or routine fishery work. Another factor to consider is the ratios of money spent on data collection and the value of the fishery to US interests.
 - g. Current data collection activities for CPS and HMS appear to be very efficient with respect to human and shipboard resources.

Minor points:

- h. The data and near zero fishery for Pacific mackerel are not sufficient to support the current assessment approach, particularly since a sophisticated analytical model is not needed at this time.
- i. Ecosystem management can be used to justify almost any type of study but one wonders if a narrower and deeper focus with more linkage to data collected in other programs might provide more benefits for HMS and result in better use of resources.
- j. HMS seems to operate with little support from other program units. Is there scope for more interaction between HMS, oceanography and the acoustic program? With more statistical support, could the habitat occupied by HMS (proportional to stock size?) be identified based on presence-absence data from observers and probability of occurrence models? Could habitat models be used to measure HMS habitats (related to carry capacity) on an ongoing basis?
- k. It might be useful to maintain a standard reference collection of sardine otoliths of agreed that can be used to train new age readers and test current readers. This would be in addition to current otolith exchange programs. These efforts are important because sardine ages are probably naturally imprecise and because there is currently so much variability in ageing results among labs.
- l. Trawls (of one or two types?) are used to collect samples of sardines and other fish during the spring sardine ichthyoplankton and summer acoustic SaKe surveys. The number of adults collected is often too small for use in daily egg production spawning biomass estimates. A trawl better able to catch sardine might be of more use in these surveys.
- m. Apparent recent declines in sardine recruitment may be partly due to a common size selectivity pattern in which the capture efficiency for small individuals is substantially lower than for larger sizes. Some estimate of size selectivity of the trawl gear would be useful in understanding the data.

2) Opportunities that should be pursued. (CPS 2, HMS 2)

- a. CPS and HMS scientists aggressively pursue technical and funding opportunities involving, for example, archival tags, genetic studies, acoustics, etc. They recognize areas for future improvements to surveys and are likely to aggressively pursue opportunities as they come up if resources are available.
- b. If anything and from the standpoint of data, the Center is pursuing too many activities with diversion of resources having serious effects on data collection and management efforts (see #4).

Minor points:

- c. Sardine probably has probably the most certain link between recruitment and simple and readily available environmental data (SST) among fish stocks around the world.

However, the link is not used in assessment or management of the stock. It might be useful to ask oceanography and stock assessment staff to work on the assessment model between major assessments to determine if SST could be used to improve assessment and to consider whether the information might be used to enhance management of the sardine stock.

- d. There are few examples of collaborative or cooperative work with fishing or environmental interests. I am not sure if this is a good or bad thing.
- e. It may be constructive to build stronger collaborative relationships with the California Department of Fish and Wildlife (CDFW) between the Center and CDFW because CDFW provides landings, port sample and age data used in stock assessments and because they manage one of the two major species included in the CPS Fishery Management Plan. If an area of shared interest is identified, then it may be useful to house CDFW staff at the Center to facilitate cooperative scientific and collaborative work. It may be possible to pay CDFW staff to carry out functions that could not be completed otherwise due to staffing limitations while building stronger collaborative relationships at the same time. CDFW labor may be more cost effective than contractors.
- f. There was no mention of collaborative work with the University of California. Is this connection used to fullest benefit?
- g. Center economists might be able to help refine CPUE standardization using variables and approaches used in economic studies that characterize temporal changes in fishing effort and fishing power. There might be opportunities particularly in fisheries where regulations have caused a reduction to smaller but more efficient fleets.

3) Scientific/technical approach (CPS 3, HMS 2)

- a. The scientific and technical approaches used in data collection procedures for CPS appear to be sound.
- b. HMS staff are doing the best that they can under current conditions. However, the ability of HMS surveys to measure population trends is unavoidably very low because the surveys are small relative to fishery and stock distributions. The HMS survey data are not used in stock assessments with a few exceptions.
- c. In contrast, the approaches used in HMS population biologists to measure growth rates, etc. are sound and certainly useful.

Minor points:

- d. The HMS angler survey collects data (mails survey forms) to fishers who participated in the survey during recent years. The data collected from this small and self selecting sample are probably not useful for making population inferences

4) Organization and priorities re data. (CPS 1, HMS 1)

- a. Shortcomings in the data management and data support for scientists were obvious for CPS and HMS. Important data sets are undocumented and housed on the desktop computers of individual scientists. Scientific staff report spending larger amounts of time extracting data than would be expected. Sorting and recording data from CalCOFI plankton samples are at least one year behind even as additional samples are collected. Existing data structures and formats are obsolete.
- b. Lack of staff to collect, qa/qc, maintain and design databases are important contributors to the data problems. It is possible to blame unfilled positions on fiscal problems and recent retirements and these are certainly contributing factors. However, the severity of the problems indicates that the care and feeding of data has not been a major priority at the Division and Center level for a long time. The lack of plankton sorters, programmers at the project level, and a database manager are examples of this problem at the data collection, intermediate and highest levels.
- c. To solve the data problems, it will probably be necessary to fill vacant data positions at a higher priority level and to shift staff from lower priority projects to data collection and management. Unless significant new resources and staff are available, it will probably be necessary to eliminate some low priority projects to free up resources.
- d. The Center should consider establishing a group devoted to building and managing databases used by a wide range of programs. This group should include a well trained database manager to carry out high level design, development and management of data bases.
- e. There is a major need for data management staff at the lower program levels for data entry, qa/qc, extracting data and helping scientists access the data. These staff should be closely associated with individual programs the data collected and used by the program.
- f. In summary, the problems with data are tied up in priorities that need to be laid out clearly. The priorities that seem to be competing with data include the Center's high level of activity in scientific questions, which are not immediately applicable to fishery management, and aggressive pursuit of new approaches and techniques. It is hard to argue with the competing activities and many NMFS scientists feel that science and creative approaches receive too little attention in their laboratories. However, data management is a central NMFS function and a product with enduring scientific and practical value.
- g. Where possible, try to use FTE's to fill vacant program level data positions because FTE labor is more cost effective and because corporate memory is desirable at the program level. Contractors might be suitable at the upper (data manager) and at most of the low level (data collection) positions.
- h. I feel that relative priorities should be suggested initially by task leaders (below the Division Chief) and that this initial list be considered carefully in decisions by the Science Director and Division Chiefs.
- i. Culture shock.

5) Scientific conduct etc. (CPS 2; HMS 2)

- a. Both CPS and HMS scientists and staff have scientific integrity, high levels of knowledge, work very hard and perform at level 3. Given that, my comments focus on data integrity with respect to survey design, peer review and transparency). Confidentiality and PII are not issues because it is covered by the “rule of three” NMFS policy. I don’t see how PII is involved.
- b. CPS surveys appear to be well designed and thoroughly reviewed.
- c. HMS surveys suffer from inherent limitations described above which interfere with good survey design. It was not clear if HMS surveys are ever reviewed to determine scientific merit.
- d. Transparency is a major issue for CPS and HMS due to problems with current data management approaches. It is apparently difficult to provide certain survey data to interested parties on short notice. Documentation may not be available.
- e. I believe that Center scientists and staff have a high level of scientific integrity. There are issues related to the integrity of data. Undocumented data in ad-hoc data bases may be at risk. No information was provided regarding qa/qc procedures, which may not be adequate.

Reviewer 5

Overarching Questions

- Relationship of current and planned fishery assessment data activities to Center fishery assessments mandates and requirements – is the Center doing the right things?

CPS: RATING 3 (EXCEEDS EXPECTATIONS)

1. The planned expansion of the CALCOFI survey back into Mexican waters is excellent.
2. The expansion of a coordinated set of surveys between adult trawl, acoustics, and CALCOFI should allow NMFS to broaden its portfolio of species. In particular, the plan provides a means to address some of the low volume species.
3. An expansion of the spring survey by one week makes sense and should move the duration back closer to what has traditionally been the length.
4. The unfilled data manager positions and in general the effects of the sequestration have hampered the centers ability to fulfill their duties in a timely manner. In general there is agreement with their goal to fast track existing vacancies; in particular assessment- SSC, statistician, data management, life history, and sea-going.
5. A set of priorities should be established for the various CPS responsibilities of the center. The expanded goal of assessment for a broader array of species will strain available personnel so that some priorities need to be set.

HMS: RATING 3 (EXCEEDS EXPECTATIONS)

1. Core vacancies in the data manager positions hampers their effectiveness and in general the effects of the sequestration have hampered the centers ability to fulfill their duties in a timely manner. The review panel was told that currently there is 1 FTE for Fisheries Monitoring. This is a historic low and insufficient to meet current treaty obligations, MSRA obligations, conservation mandates and the legal mandates associated with archiving and serving of data.
 2. The expansion of the charges of the group into other species, such as the increasing array of shark species, is causing staff to extend their travel at the decrement of other responsibilities. There needs to be an expansion of the number of staff to accommodate this increase in duties.
 3. There are other vacancies aside from the data positions which should be filled.
 4. A set of priorities should be established for the various HMS responsibilities of the center.
- Opportunities – are there opportunities that the Center should be pursuing in collecting and compiling fishery assessment data, including shared approaches with partners?

CPS: RATING 3 (EXCEEDS EXPECTATIONS)

1. Partnering with Mexico has been a traditional alliance. It is encouraging to hear that dialogue continues and that there are good relationships between the scientists. Some improvements in dialogue and cooperation at higher managerial levels could lead to further gains.
2. Continuation of the Sake survey into Canadian waters has fostered good cooperation between Canadian and NMFS scientists and with the NW NMFS center. A continuation of the survey and a more off-shore expansion to pick up some other CPS species would benefit the center's responsibilities to assess a broader range of species. The main problem now is that with the limited personnel, the expanded survey has stretched the existing personnel beyond what is reasonable.
3. The new vessel, the Lasker, provides more advanced acoustic capabilities which should permit researchers to understand what if any deficiencies exist in the current acoustic samplers.
4. Agree with the group's finding that there is a need for broad, ongoing, comprehensive, and adaptive CPS field sampling/laboratory/database framework.
5. Agree with the groups finding that there needs to be improved monitoring and management of market squid.

HMS: RATING 3 (EXCEEDS EXPECTATIONS)

1. The group has been a major contributor to ISC working groups. There have been considerable personnel demands to remain a contributor and it is not clear if the extensive travel and meeting schedules can be maintained over the long run. Some prioritization of the ISC work is advisable and some working group meetings could perhaps be skipped and just focus on presence at the most important sessions.
 2. Continued cooperation with Mexican colleagues is encouraged for the thresher shark data collection and assessment.
 3. For swordfish, continued cooperation is encouraged between the U.S. and Mexico and between PIFSC and SWFSC.
- Scientific/technical approach – are the Center's fishery data objectives adequate, and is the Center using the best suite of techniques and approaches to meet those objectives?

CPS: RATING 3 (EXCEEDS EXPECTATIONS)

1. The addition of a sophisticated joint trawl/acoustic sampling protocol has shown the ability to improve the precision of the survey abundance estimates particularly for sardines.
2. The sardine assessments utilize appropriate data. The continued collection of survey abundance estimates, catch age composition, and life history information all contribute to the general soundness of the assessments.
3. The planned expansion of the survey to a broader array of species will improve the data on the lower volume species in particular.

HMS: RATING 2 (MEETS EXPECTATIONS)

1. The northern albacore assessment utilizes appropriate data and it is utilized in an appropriate method.
 2. Estimation of life history characteristics, in particular growth rates of albacore, have contributed to improving the assessments.
 3. The group is on the right path with their plan to develop protocols for archiving research data so there is some consistency across projects.
 4. The shark survey design needs to be reviewed and evaluated for reliability. The survey appears to lack the precision desired. A statistician should be recruited for the evaluation and to recommend improvements.
 5. A comparison is needed of shallow versus deep-set longline blue shark CPUE data for the Hawaii fishery.
- Organization and priorities – is the Center’s fishery data system properly organized to meet its mandates and is the allocation of resources among program appropriate?

CPS: RATING 2 (MEETS EXPECTATIONS)

1. The large number of vacancies in their data management staff has caused an inordinate amount of work to be shifted to assessment staff.
2. Databases need to be modernized and fitted with user friendly front ends.

HMS: RATING 2 (MEETS EXPECTATIONS)

1. The large number of vacancies in their data management staff has been partly temporarily offset by contractors but that is not a permanent solution.
 2. Data quality has likely been degraded by the lack of personnel to implement the kinds of quality control desirable.
 3. Database programs should be modernized.
- Scientific conduct – are the Center’s fishery data programs being conducted properly (survey design, integrity, peer review, transparency, confidentiality, PII, etc.)?

CPS: RATING 3 (EXCEEDS EXPECTATIONS)

1. CALCOFI surveys have a long history of detailed review and evaluation. The resulting surveys are among the best in the world for the general survey of the ecology on near-shore species.
2. The externally reviewed acoustic surveys with complementary trawling are well regarded and represent modern methods of surveys.
3. Peer reviewed publication of results and findings provides transparency to the studies.
4. The weakest part of the group is the large number of vacancies particularly in the data management staff. Sequestration has magnified the problem.

HMS: RATING 2 (MEETS EXPECTATIONS)

1. The large number of vacancies particularly in the data management staff has hampered the group's ability to do as well with data programs as desired.
2. As discussed by the staff, they need to develop protocols for archiving research data so there is some consistency across projects.
3. Scientists working on HMS species are well regarded by peers.
4. Agree with the staff that if resources permit, develop an online reporting system for angler surveys.

APPENDIX 1

Agenda for Review of Data Used in CPS and HMS Assessments
29 July– 1 August
Southwest Fisheries Science Center
Pacific Room

(version: 25 July 2013)

Day 1 - Monday, 29 July

Time	Topic	Duration	
		Talk	Q&A
9:00 AM	1.0 Introduction and Review Panel Charge <i>Welcome and introduce the panel and Southwest Fisheries Science Center (SWFSC) staff, describe the purpose of the program review, review the TOR and the daily schedule.</i> Cisco Werner	20	5
9:25 AM	2.0 SWFSC Overview <i>Describe the mission and organization of the SWFSC.</i> Cisco Werner	10	5
9:40 AM	3.0 Fisheries Management Background: Coastal Pelagic Species (CPS) and Highly Migratory Species (HMS) <i>Describe CPS and HMS fisheries management and why and when managers need data . Describe the short, medium and long-range data needs .</i> Mark Helvey	15	5
10:00 AM	3.1 Background on SWFSC CPS and HMS Monitoring <i>Describe the California Current Coastal Pelagic Species and the North Pacific Highly Migratory Species complexes including relevant economic, ecological and societal significance, and the SWFSC role in assessment and monitoring. Organization of the Fisheries Resources Division and budget associated with data collection, management and dissemination. Describe in general terms what data the SWFSC collects and why.</i> Russ Vetter	20	10

10:30 AM	3.2 Overview of Stock Assessments <i>Describe how stock assessments are conducted in general and what data are needed.</i> Kevin Piner	15	5
10:50 AM	Break	15	

DATA USED IN CPS STOCK ASSESSMENTS

11:05 AM	4.0 Overview of CPS fisheries and their management <i>Describe CPS fisheries, changes in management, and SWC CPS assessment responsibilities including information on numbers of species in the FMP, numbers of assessed stocks. Describe clients of the CPS assessments and how the Pacific Fisheries Management Council uses them. Dale Sweetnam</i>	15	5
11:25 AM	5.0 General Overview of CPS Assessment Models and the Types of Data Used <i>Describe how the assessments use fishery-dependent data and fishery-independent data in CPS stock assessments. Include assessment assumptions and complexities and relate how these drive or are affected by data collection and describe areas for improvement. Describe typical (Pacific sardine) vs. non-typical (market squid) assessments. Describe what data are available versus what would be desirable. Describe how well assessments are working. Kevin Hill</i>	30	10
12:05 PM	6.0 Fishery-Dependent Data Used in CPS Assessments <i>Provide an overview of fishery-dependent data (catch and biological sampling) and how they are collected from Ensenada, Southern California, Central California, Oregon, Washington, and British Columbia. Describe how the Center manages or accesses data and any issues associated with access, management or accuracy. Kevin Hill</i>	25	5
12:35 PM	Lunch <u>Fishery-Independent Data Used in CPS Assessments</u>	90	
2:05 PM	7.0 Oceanographic Data Used in Adaptive Sampling and CPS Assessments <i>Describe how remotely sensed and in-situ oceanography is used to design surveys and in assessments; describe data management issues. Sam McClatchie</i>	20	5

2:30 PM	7.1 Egg and Larval Data Used in CPS Assessments <i>Describe how egg and larval data are collected, coverage, processing, quality control, issues of accuracy. Describe data management issues.</i> Andrew Thompson	20	5
2:55 PM	7.2 CPS Adult Life History Data and DEPM Calculation <i>Describe life history data are collected, coverage, processing, quality control, issues of accuracy; describe how the daily egg production method (DEPM) values are calculated; Describe data management issues.</i> Emmanis Dorval	20	5
3:20 PM	7.3 Acoustic methods, ATM calculation <i>Describe acoustic sampling and data processing, the acoustic-trawl method (ATM) for estimating CPS data; Describe coverage, processing, quality control, issues of accuracy and data management issues.</i> David Demer	30	10
4:00 PM	Break	15	
4:15 PM	Public Comment		15
4:30 PM	Panel Questions and Discussion on Data for CPS Assessments		20
4:50 PM	Private Panel Work - <i>Discussion of Panel TOR and organization. Work on Panel report.</i>	50	
5:40 PM	Adjourn for the Day		
6:00 PM	No Host Reception at Eddie V's - La Jolla, CA		

Day 2 - Tuesday, 30 July

Time	Topic	Duration	
		Talk	Q&A
8:30 AM	Brief review and schedule for Day 2. Cisco Werner	10	5

DATA USED IN CPS STOCK ASSESSMENTS continued

Fishery-Independent Data Used in CPS Assessments continued

8:45 AM	7.4 CalCOFI and Spring Sardine Surveys <i>Provide an overview of how life-history data are collected via the CalCOFI and Spring Sardine surveys including sampling design and how the data are managed and issues with data management.</i> Sam McClatchie	20	5
9:10 AM	7.5 Sardine-Hake (SaKe) Survey. <i>Provide an overview of how data are collected via the Sake Survey including the sampling design; describe how the data are managed and any issues with data management.</i> David Demer	10	5
9:25 AM	8.0 Challenges and Emerging Issues with CPS Data Management <i>Provide an overview of emerging CPS issues that may require future assessments and increased data: unassessed and underassessed stocks, data management standardization and quality control (future plans) and funding and staffing issues.</i> Russ Vetter	30	10
10:05 AM	Break	15	
DATA USED IN HMS STOCK ASSESSMENTS			
10:20 AM	9.0 General Overview of HMS Fisheries <i>Provide a general overview and history of the tuna, billfish, and shark fisheries, focusing on albacore, swordfish and blue sharks, in the North Pacific; highlight how transnational stocks provide their own challenges in monitoring and assessing.</i> Russ Vetter	15	5
10:40 AM	9.1 General Overview of HMS Management Framework <i>Describe the clients of the SWFSC assessments and data and how they use the assessments; describe the SWFSC role in assessing and monitoring (vs. PIFSC's).</i> Suzanne Kohin	15	5
11:00 AM	9.2 HMS Data Responsibilities <i>Describe what fisheries data we collect and why; how we collect and manage fisheries data, what the biggest pieces are, and who the users are (e.g. SPC, IATTC).</i> John Childers	30	10

11:40 AM	9.3 HMS Assessment Models and the Types of Data Used <i>Describe how the HMS assessments use fishery-dependent data and fishery-independent data, how the examples that will be presented represent the data, and how the specificity of the data, which differs among species group, affects the assessments. Include assessment assumptions and complexities and relate how these drive or are affected by data collection and describe areas for improvement. Describe what data are available versus what would be desirable.</i> Kevin Piner	20	5
12:05 PM	10.0 Overview of Tuna Fisheries <i>Provide a general overview and history of the tuna fisheries, focusing on albacore as an example of a data-rich and targeted species, in the North Pacific.</i> Russ Vetter	15	5
12:25 PM	Lunch	60	
1:25 PM	10.1 Fishery-Dependent Data Used in Tuna Assessments <i>Provide an overview of fishery-dependent data (including catch and biological sampling and cooperative research) and how they are collected from/by the international contributors, and domestically. Describe how the Center manages and/or accesses data and any issues associated with access, management or accuracy.</i> John Childers	30	10
2:05 PM	10.2 Fishery-Independent Data Used in Tuna Assessments <i>Provide an overview of fishery-independent data collections methods including how life-history data is collected from/by the international contributors, and domestically; describe coverage, processing, and quality control. Describe how the Center manages and/or accesses data any issues associated with access, management or accuracy.</i> Suzanne Kohin	30	10
2:45 PM	10.3 The Albacore Assessment <i>Describe the albacore assessment, how it uses data, what data would most improve the assessment.</i> Steve Teo	15	5
3:05 PM	Public comment		15
3:20 PM	Break	15	

3:35 PM	Panel Questions and Discussion on Data for CPS and Tuna Assessments	30
4:05 PM	Panel Work - <i>Discussion and work on Panel Report.</i>	105
5:50 PM	Adjourn for the Day	

Day 3 - Wednesday, 31 July

Time	Topic	Duration	
		Talk	Q&A
8:30 AM	Brief review and schedule for Day 3. Werner	10	5
DATA USED IN HMS STOCK ASSESSMENTS continued			
8:45 AM	11.0 Overview of Billfish Fisheries <i>Provide a general overview and history of the billfish fisheries, focusing on swordfish as a data-moderate species, in the North Pacific. Steve Stohs</i>	15	5
9:05 AM	11.1 Fishery-Dependent Data Used in Billfish Assessments <i>Provide an overview of fishery-dependent data (including catch and biological sampling and cooperative research) and how they are collected from/by the international contributors, and domestically. Describe how the Center manages and/or accesses data and any issues associated with access, management or accuracy. John Childers</i>	15	5
9:25 AM	11.2 Fishery-Independent Data Used in Billfish Assessments <i>Provide an overview of fishery-independent data collections methods including how life-history data is collected from/by the international contributors, and domestically; describe coverage, processing, and quality control. Describe how the Center manages and/or accesses data any issues associated with access, management or accuracy. Suzanne Kohin</i>	30	10
10:05 AM	11.3 The Swordfish Assessment <i>Describe the swordfish assessment, how it uses data, what data would most improve the assessment. Kevin Piner</i>	10	5
10:20 AM	Break	15	

10:35 AM	12.0 Overview of Shark Fisheries <i>Provide a general overview and history of the shark fisheries, focusing on blue shark as a data-poor species, in the North Pacific.</i> Suzanne Kohin	15	5
10:55 AM	12.1 Data Used in Shark Assessments <i>Provide an overview of fishery-dependent and fishery-independent data (including catch and biological sampling and cooperative research) and how fishery-dependent are collected from/by the international contributors, and domestically and how life-history data are collected from/by the international contributors, and domestically; describe thresher and juvenile shark surveys; describe coverage, processing, and quality control. Describe how the Center manages and/or accesses data and any issues associated with access, management or accuracy.</i> Suzanne Kohin	30	10
11:35 AM	12.2 The Blue Shark Assessment <i>Describe the blue shark assessment, how it uses data, what data would most improve the assessment.</i> Tim Sippel	15	5

11:55 AM	13.0 Challenges and Emerging Issues with HMS Data Management <i>Provide an overview of emerging HMS issues that may require future assessments and increased data: unassessed and underassessed stocks, data management standardization and quality control (future plans) and funding and staffing issues.</i> Russ Vetter	30	10
12:35 PM	Public comment		15
12:50 PM	Lunch	60	
1:50 PM	Questions from Panel on Data used in Billfish and Shark Assessments		40
2:30 PM	Discussion on all topics		50
3:20 PM	Break	15	
3:35 PM	Drafting of Report by Panel - <i>Presenters should try to be available for interview by the panel as requested</i>	95	
5:10 PM	Adjourn for the Day		

Day 4 - Thursday, 1 August

Time	Topic	Duration Talk	Q&A
9:00 AM	Drafting of Report by Panel - <i>Presenters should try to be available for interview by the panel as requested</i>	180	
12:00 PM	Lunch	60	
1:00 PM	Drafting of Report by Panel - <i>Presenters should try to be available for interview by the panel as requested</i>	120	
3:00 PM	Panel report out with Center Leadership - Private. Panel and Leaders only	20	10
3:30 PM	Adjourn for the Day		